

REMARKS

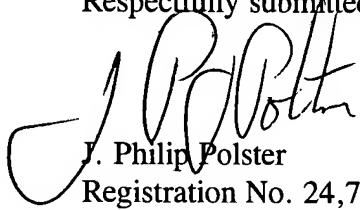
The foregoing amendment supplements Amendment A, which cancels claims without prejudice in order to reduce the filing fee,

The present amendment primarily corrects typographic and formal matters. The only amendment of substance to an independent claim is the change in claim 150 from "cable" to "line". All of the newly added claims are dependent on existing claims.

All of the claims as amended under Article 34 in the International stage have been indicated as meeting the requirements of the PCT. It is therefore believed that the claims as presented should be allowable.

Applicant brings to the attention of the Examiner U.S. Patent 6,264,140, issued July 24, 2001 to McGeer et al.

Respectfully submitted,



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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: William R. McDonnell

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FOR: LAUNCH AND RECOVERY SYSTEM FOR UNMANNED AERIAL VEHICLES

National Phase of PCT/US00/20099

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CLAIMS MARKED TO SHOW CHANGES

128. An aerial launch and recovery system for an aircraft, said system comprising:

a lifting apparatus for carrying said aircraft to an elevated altitude,

a tow line connecting said lifting apparatus to a base structure,

launching means, and

arrestment means;

said lifting apparatus being aerially deployed from said base structure, said launching means being adapted to carry said aircraft to said elevated altitude and release said aircraft for flight mode, said arrestment means being adapted to capture and retain said aircraft from mid-air flight, said tow line enabling said lifting apparatus and said captured aircraft to be pulled back to said base structure.

129. An aerial launch system for an aircraft, said system comprising:

a lifting apparatus for carrying said aircraft to an elevated altitude,

a tow line connecting said lifting apparatus to a base structure, and

launching means,

said launching means being adapted to carry said aircraft to said elevated altitude and release said aircraft for flight mode.

130. (amended) The aerial launch system of claim 129, [in which said lifting apparatus is a parasail,] said base structure comprising a transportable conveyance comprising a water craft capable of creating a relative wind through forward movement sufficient to provide lift to said [parasail] lifting apparatus.

Claim 131 cancelled without prejudice.

132. The aerial launch system of claim 129 in which a winch is provided to facilitate aerial deployment and recovery of said tow line, said winch enabling said lifting apparatus to be maintained at variable altitudes.

133. The aerial launch system of claim 132 in which pulleys are provided for varying the point of deployment of said tow line from said base structure.

Claims 134-136 cancelled without prejudice.

137. (amended) An aerial recovery system for an aircraft, said system comprising:

a lifting apparatus for carrying said recovery system to an elevated altitude, a tow line connecting said aerial apparatus to a base structure, and arrestment means;

said lifting apparatus being aerially deployed from said base structure, said arrestment means being adapted to capture and retain said aircraft from mid-air flight, said tow line enabling said lifting apparatus and said captured aircraft to be pulled back to said base structure.

138. The aerial recovery system of claim 137 in which said lifting apparatus is a parasail, said base structure comprises a transportable conveyance comprising a water craft capable of creating a relative wind through forward propulsion sufficient to provide lift to said parasail.

Claim 139 cancelled without prejudice.

140. The aerial recovery system of claim 137 in which said lifting apparatus is a lighter-than-air balloon.

141. The aerial recovery system of claim 137 in which said lifting apparatus is a lighter-than-air balloon in combination within a parasail.

142. The aerial recovery system of claim 137 in which said base structure comprises a transportable conveyance comprising a wheeled vehicle.

143. The aerial recovery system of claim 137 in which said arrestment means comprises a hook attached to said aircraft in such a position whereby said hook is adapted to engage an arrestment line supported by said aerial lifting apparatus as said aircraft comes into contact with said arrestment line.

144. The aerial recovery system of claim 143 in which said arrestment line is said tow line.

145. The aerial recovery system of claim 137 in which a hook is attached to said recovery system in such a position whereby said hook is adapted to engage an arrestment line attached to said aircraft as said aircraft comes into contact with said recovery system.

146. The aerial recovery system of claim 137 in which a high visibility strip of material is attached to said recovery system near the point of engagement of said aircraft to

said recovery system to assist the pilot in acquiring and identifying the engagement point and for guidance in maneuvering said aircraft into engagement with said recovery system.

147. The aerial recovery system of claim 137 in which a camera is attached to said recovery system near the point of engagement of said aircraft to said recovery system, said camera pointing in the direction of said incoming aircraft so as to detect said aircraft for guidance in maneuvering said aircraft into engagement with said recovery system.

148. The aerial recovery system of claim 137 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is non-coincident.

149. The aerial recovery system of claim 148 in which said flight path and the straight extension of said flight path does not pass vertically over said base structure.

150. (amended) An aerial recovery system for an aircraft, said system comprising;

[An] an arrestment [cable] line held up at at least one end,
[Said] said aircraft [contains] containing a device for capturing said [cable] line,
said aircraft [contains] containing structure suitable for deflecting said [cable] line laterally
into engagement with said capturing device.

151. (amended) The aerial recovery system of claim 150 where said [cable] line is held up by a lifting apparatus.

152. The aerial recovery system of claim 150 where said capturing device is a hook.

153. (amended) The aerial recovery system of claim 150 where said hook has a [cable] line retaining device.

Claims 154-156 cancelled without prejudice.

157. The aerial recovery system of claim 150 in which said capturing device is positioned on a forward inboard edge of a wing of said aircraft.

Claim 158 cancelled without prejudice.

159. (amended) The aerial recovery system of claim 150 in which a propeller guard deflects said arrestment [cable] line away from the propeller.

Claims 160-167 cancelled without prejudice.

168. (amended) The aerial recovery system of claim 137 in which there is an engagement point on the recovery system for contact and capture of said aircraft, a suspension [cable] line supported by said lifting apparatus in turn supports said engagement point, and a mechanism is provided to retract said suspension [cable] line in order to raise said engagement point and said aircraft.

Claims 169-174 cancelled without prejudice.

175. The aerial recovery system of claim 137 in which pulleys are provided for varying the point of deployment of said tow line from said base structure.

176. A recovery system for an aircraft, said system comprising a vertically oriented arrestment line supported from a structure having sufficient height to position said arrestment line in a path of said aircraft when in flight such that said aircraft is adapted to engage said arrestment line to enable arrestment and recovery of said aircraft on said arrestment line.

177. The recovery system of claim 176 where said structure is a boom.

178. A recovery system for an aircraft, said system comprising a plurality of arrestment lines aligned in parallel orientation and having a spaced apart relationship to each other, said arrestment lines being supported from a structure having sufficient height to position said arrestment lines in a path of said aircraft when in flight such that said aircraft is adapted to engage at least one of said arrestment lines to enable arrestment and recovery of said aircraft on said arrestment lines.

179. The recovery system of claim 178 in which said support structure comprises a boom, said arrestment lines being supported in a vertical orientation from said boom.

180. The aerial recovery system of claim 137 in which said arrestment means contains a net.

181. The aerial recovery system of claim 180 wherein said net is suspended from said tow line.

182. The aerial recovery system of claim 180 in which said net hangs in a vertical plane.

183. The aerial recovery system of claim 180 in which said net hangs in the plane of said tow line.

184. (amended) An aerial recovery system for an aircraft, said system comprising:

[A] a net, a draw string that passes around the periphery of said net and is slidably attached at points around the periphery of said net, a support system sufficient to carry the weight of the net and the aircraft, said draw string is connected to said support system and

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said draw string is suitable for pulling the periphery of the net together around the back of said aircraft to encapsulate said aircraft during arrestment.

185. An aerial recovery system for an aircraft, said system comprising: an aerial apparatus for carrying said recovery system to an elevated altitude, a net to capture said aircraft, said net has at least three attach points spaced around the periphery of said net, lines attached to each of said net attach points extend up to support said net and aircraft from said aerial apparatus, the load on said lines during and after arrestment holds the net around said aircraft to help retain said aircraft.

Claim 186 cancelled without prejudice.

187. An aerial recovery system, said system comprising: an aircraft, a net suspended below a support system, said support system capable of holding the weight of the net and aircraft, a hook on said aircraft positioned so as to engage a line in said net during engagement.

Claims 188-195 cancelled without prejudice.

196. A method for recovering an aircraft, said method comprising steps of:
deploying a lifting apparatus to an elevated altitude,
connecting a lifting apparatus to a base structure by a tow line, and
maneuvering said aircraft into arrestment means while in flight.

197. The method for recovering an aircraft of claim 196 in which said lifting apparatus is a parasail.

198. The method for recovering an aircraft of claim 196 in which said maneuvered aircraft is adapted to engage said recovery system while flying a non-coincident flight path.

Claims 199-208 cancelled without prejudice.

Please add the following claims 209-230:

209. The aerial recovery system of claim 150 in which said structure is swept aft to reliably deflect said arrestment line to said capturing device.

210. The aerial recovery system of claim 209 in which said structure is swept aft 5 degrees or more to reliably deflect said arrestment line to said capturing device.

211. The aerial recovery system of claim 209 in which said structure is swept aft 10 degrees or more to reliably deflect said arrestment line to said capturing device.

212. The aerial recovery system of claim 150 in which the leading edge of said structure sweeps aft to reliably deflect said arrestment line to said capturing device.

213. The aerial recovery system of claim 212 in which the leading edge of said structure sweeps aft more than 5 degrees to reliably deflect said arrestment line to said capturing device.

214. The aerial recovery system of claim 212 in which the leading edge of said structure sweeps aft more than 10 degrees to reliably deflect said arrestment line to said capturing device.

215. The aerial recovery system of claim 137 in which said lifting apparatus is controllable for steering purposes or for changing the lift or drag characteristics of said lifting apparatus.

216. The aerial recovery system of claim 150 in which the capturing device is located inboard of the aircraft's wingtip.

217. The aerial recovery system of claim 216 in which the capturing device is located inboard more than 5% of the wing semi-span.

218. The aerial recovery system of claim 137 in which said tow line supports the weight of at least a portion of the arrestment line or lines used in the recovery process whether operating individually or connected together to form a net, said arrestment lines hanging in a generally vertical plane below said tow line, said tow line being held in the air by said aerial lifting apparatus.

219. The aerial launch system of claim 129 where said launching means is held in the air by said tow line, said tow line being held in the air by said lifting apparatus.

220. The aerial recovery system of claim 150 in which multiple generally vertically oriented arrestment lines are spaced apart across the direction of travel of said aircraft as it approaches for recovery so as to increase the lateral capture envelope of said recovery system.

221. The aerial recovery system of claim 150 in which said capturing device is located generally over the center of gravity of the vehicle when the wings are level so that the aircraft is held in a level attitude after arrestment.

222. The method for stowing and deploying of the aerial lifting apparatus of claim 137 in which said lifting apparatus has riser lines that extend up to a fabric canopy and a winch is used to retract and extend said tow line and riser lines onto a drum of said winch.

223. The method for stowing and deploying of the aerial lifting apparatus of claim 129 in which said lifting apparatus has riser lines that extend up to a fabric canopy and a winch is used to retract and extend said tow line and riser lines onto a drum of said winch.

224. The method for recovering an aircraft of claim 150 in which said line is deflected inboard relative to the aircraft.

225. The aerial launch system of claim 130 in which said lifting apparatus is a parasail, parafoil or other deployable fabric lifting system.

226. The aerial recovery system of claim 150 in which said system is designed to rotate said aircraft to a generally wings level position and hold said aircraft in said wings level position.

227. The aerial recovery system of claim 150 in which said line is supported in the air by a rotor.

228. The aerial recovery system of claim 150 in which said line is held up by a boom that can rotate about a generally vertical axis.

229. The aerial recovery system of claim 150 in which said line is supported in the air by another line strung generally horizontally between two supports.

230. The aerial recovery system of claim 150 in which said line is supported in the air by an aircraft.